

We claim:

1. A wireless communication device for communications with clients in a communication network, the device comprising:
  - at least one antenna;
  - 5 a receive processor that processes receive signals from said antenna and provides corresponding receive location information;
  - a media access controller that receives signals from said receive processor and provides output signals for transmission;
  - 10 a location-information transformer that transforms said receive location information into transmit location information; and
  - a transmit processor that provides transmit signals to said antenna in response to at least one of said output signals and said transmit location information.
2. The communication device of claim 1, wherein said media access controller compares the age of said receive location information with a predetermined time coherence and said transmit processor is configured to provide a transmit signal to said antenna that is:
  - 5 spatially processed in accordance with said transmit location information if said age is less than said time coherence; and
  - spatially processed in accordance with predetermined location information if said age exceeds said time coherence.
3. The communication device of claim 2, wherein said media access controller is configured to establish said time coherence from at least one of a predetermined value and a default value updated with observed changes of said receive location information.
4. The communication device of claim 2, further including a database for storage of said receive location information and said age.
5. The communication device of claim 1, wherein said media access controller is configured to direct spatial processing of said

receive processor and said transmit processor.

6. The communication device of claim 1, further including a modem that demodulates signals from said receive processor and modulates said output signals.

7. The communication device of claim 1, wherein said media access controller is configured to:

5       command said transmit processor to spatially process an output signal carrying a channel reservation request in accordance with predetermined location information that corresponds to all of said clients; and

10       command said receive processor to spatially process a receive signal to enhance receipt of a clear channel acknowledgment from one of said clients and to provide corresponding receive location information to said location-information transformer.

8. The communication device of claim 7, wherein said media access controller is configured to subsequently command said transmit processor to spatially process a data-carrying output signal in accordance with transmit location information from said  
5       location-information transformer.

9. The communication device of claim 1, wherein said media access controller is configured to partition a data signal into data fragments and to:

5       command said transmit processor to provide a first data fragment to said antenna in an output signal that is spatially processed in accordance with predetermined location information that corresponds to all of said clients;

and

10       command said receive processor to spatially process a receive signal to enhance receipt of an acknowledgment from one of said clients and to provide corresponding receive location

information to said location-information transformer.

10. The communication device of claim 9, wherein said media access controller is configured to subsequently command said transmit processor to provide remaining data fragments to said antenna in output signals that are spatially processed in accordance with transmit location information from said location-information transformer.

11. The communication device of claim 1, wherein said media access controller is configured to:

command said receive processor to spatially process a receive signal to enhance receipt of a channel reservation request from one of said clients and to provide corresponding receive location information to said location-information transformer; and

command said transmit processor to spatially process an output signal carrying a clear channel acknowledgment wherein said process is in accordance with predetermined location information that corresponds to all of said clients.

12. The communication device of claim 11, wherein said media access controller is configured to subsequently command said receive processor to spatially process a data-carrying receive signal in accordance with transmit location information from said location-information transformer.

13. The communication device of claim 1, further including a plurality of modems for demodulating said receive signal and modulating said transmit signal and wherein said media access controller is configured to:

command said receive processor to spatially process first and second receive signals to enhance receipt of channel reservation requests from first and second ones of said clients and to provide corresponding receive location

10           information to said location-information transformer; and  
          command said transmit processor to spatially process first and  
          second output signals carrying clear channel  
          acknowledgments wherein said process is in accordance  
          with said transmit location information.

14. The communication device of claim 13, wherein said media access controller is configured to subsequently command said receive processor to process first and second receive signals to enhance receipt of data from said first and second clients.

15. The communication device of claim 1, wherein said media access controller is configured to measure and store receive and transmit signal propagation delays associated with at least one of said clients.

16. The communication device of claim 15, wherein said media access controller compares the age of said receive location information with a predetermined time coherence and is configured to adjust said age to accommodate said propagation delays.

17. The communication device of claim 15, wherein said media access controller is configured to advance said transmit signals to accommodate said propagation delays.

18. The communication device of claim 15, wherein said media access controller is configured to extend reservation times for said receive and transmit signals associated with a respective one of said clients.

19. The communication device of claim 1, wherein said transmit location information is in the form of at least one of a selected antenna, a selected beam generated by said antenna, a phase/amplitude signal, and a set of complex coefficients.

20. The communication device of claim 1, wherein said media access controller is configured to parse said receive signals and said output signals.

21. The communication device of claim 1, wherein said receive processor, said media access controller, said location-information transformer and said transmit processor are realized with at least one of a gate arrays and an appropriately-programmed digital processor.

22. A method for communicating with clients in a communication network, the method comprising the steps of:

5       processing receive signals obtained from at least one antenna to  
          thereby provide input signals and corresponding receive  
          location information;  
      in response to said input signals, providing output signals for  
          transmission;  
      transforming said receive location information to transmit  
          location information; and  
10       providing transmit signals to said antenna in response to at  
          least one of said output signals and said transmit location  
          information.

23. The method of claim 22, further including the steps of:  
      comparing the age of said receive location information with a  
          predetermined time coherence;  
5       spatially processing said output signals in accordance with said  
          transmit location information if said age is less than said  
          time coherence; and  
      spatially processing said output signals in accordance with  
          predetermined location information if said age exceeds said  
          time coherence.

24. The method of claim 23, further including the step of  
establishing said time coherence from at least one of a predetermined

value and a default value updated with observed changes of said receive location information.

25. The method of claim 23, further including the step of storing said receive location information and said age.

26. The method of claim 22, wherein said receive signals are spatially processed and said output signals are spatially processed.

27. The method of claim 22, further including the step of demodulating said input signals and modulating said output signals.

28. The method of claim 22, wherein:

5       said providing step includes the step of spatially processing an output signal carrying a channel reservation request in accordance with predetermined location information that corresponds to all of said clients; and  
      said processing step includes the steps of spatially processing a receive signal to enhance receipt of a clear channel acknowledgment from one of said clients and providing corresponding receive location information.

29. The method of claim 28, wherein said providing step further includes the step of subsequently spatially processing a data-carrying output signal in accordance with said transmit location information.

30. The method of claim 22, further including the step of partitioning a data signal into data fragments and wherein:

5       said providing step includes the step of sending a first data fragment to said antenna in an output signal that is spatially processed in accordance with predetermined location information that corresponds to all of said clients;  
      and  
      said processing step includes the steps of spatially processing a receive signal to enhance receipt of an acknowledgment

10                   from one of said clients and providing corresponding receive location information.

31. The method of claim 30, wherein said providing step further includes the step of sending remaining data fragments to said antenna in output signals that are spatially processed in accordance with said transmit location information.

32. The method of claim 22, wherein:  
said processing step includes the steps of spatially processing a receive signal to enhance receipt of a channel reservation request from one of said clients and providing  
5                   corresponding receive location information; and  
said providing step includes the step of spatially processing an output signal carrying a clear channel acknowledgment wherein said process is in accordance with predetermined location information that corresponds to all of said clients.

33. The method of claim 32, wherein said processing step further includes the step of spatially processing a data-carrying receive signal in accordance with said transmit location information.

34. The method of claim 22, further including the steps of:  
independently demodulating a plurality of said input signals;  
independently modulating a plurality of said transmit signals;  
and wherein:  
5                   said processing step includes the steps of spatially processing first and second receive signals to enhance receipt of channel reservation requests from first and second ones of said clients and providing corresponding receive location information; and  
10                   said providing step includes the step of spatially processing first and second output signals carrying clear channel acknowledgments wherein said process is in accordance with said transmit location information.

35. The method of claim 34, further including the step of processing first and second receive signals to enhance receipt of data from said first and second clients.

36. The method of claim 22, further including the steps of measuring and storing receive and transmit signal propagation delays associated with at least one of said clients.

37. The method of claim 36, further including the steps of:  
comparing the age of said receive location information with a  
predetermined time coherence; and  
adjusting said age to accommodate said propagation delays.

38. The method of claim 36, further including the step of advancing said transmit signals to accommodate said propagation delays.

39. The method of claim 32, further including the step of extending reservation times for said receive and transmit signals associated with a respective one of said clients.

40. The method of claim 22, further including the step of storing said transmit location information in the form of at least one of a selected antenna, a selected beam generated by said antenna, a phase/amplitude signal, and a set of complex coefficients.

41. The method of claim 22, further including the steps of parsing said received signals and said output signal.